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ABSTRACT

Several models for enrollment projections have been developed based on past performance. One of these, a computer-assisted model developed at the California State University at Northridge, was tested for possible use at Los Angeles Pierce College (LAPC). From three to five previous comparable college terms are used in the model to predict enrollments for up to three academic levels; for each course, program, and department; and for the total college. Linear, curvilinear, logarithmic, or exponential models are possible. In testing this model at LAPC, the Earth Science and Business departments were selected. Data on weekly student contact hours and census enrollment were obtained for all courses and programs over the previous five years. Though this model had remarkable success in predicting enrollment within the state and university system, at LAPC the error in prediction for most cases was very large--due primarily to the artificial limitations on or increase in the number of students enrolled in specific programs caused by changing the course and section offerings. Given the predictive failure of this model, how are enrollment predictions best made? Knowledge of local economic and demographic factors permits general enrollment predictions, but decisions about program and course modifications should be based on the participation of department heads and faculty, analyses of five-year course enrollment trends, and consideration of college mission. (AYC)

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PAST PERFORMANCE, QUANTITATIVE MODELS, AND THE PREDICTION OF COMMUNITY COLLEGE ENROLLMENTS[1]

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Introduction

Enrollment projection studies have been among the most popular for institutional researchers in education. This is as it should be. Knowing the number of students expected at any school and in any program can help with the preparation for the instructional program and, in many instances, will determine the amount of money that will be available to support the program.

As racetrack touts know by instinct and researchers by study and experience, the best predictor of future performance is past performance. As a consequence, several models for enrollment projections have been developed based on past performance. Among the best in the Los Angeles area is that of California State University, Northridge (CSUN); developed by their Office of Institutional Research (Jerry Gaither, Fred Dukes and John Swanson). The computer program that implements the model uses from three to five previous comparable college terms to predict the enrollments for the future term. The model is capable of making predictions for up to three academic levels, e.g., lower-division, upper-division and graduate, as

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[1]One of the four major research projects for academic year, 1980-81 was to test the California State University, Northridge (CSUN) prediction model for use with Pierce College programs and departments. This paper represents the report of that test.

well as the total for each course, program, department and for the total college. The computer program uses the best of four predictive models: linear, curvalinear, logarithmec, or exponential. The authors of this model have had remarkable success in predicting enrollments; they are always more accurate than the predictions from the statewide system. Other institutions within the state college and university system have used or adapted the CSUN model.

This model was tested for possible use at Pierce College.

The Test

Because of the close association of CSUN and LAPC, as well as the demonstrable power of the CSUN predictive model, it was determined that this model should be tested for enrollment projection at Pierce. For the test, two departments were selected: one academic and one vocational, Earth Science and Business, respectively. Two kinds of historical data were obtained for all the courses and programs in these two departments: Weekly Student Contact Hours (WSCH) and census enrollment. Historical data were obtained covering the previous five years. These data were punched and submitted to the Office of Institutional Research at CSUN for the trial. Rather than academic levels, the data were separated into day, evening, and total enrollments and WSCH.

The resutls were disappointing--the error in prediction for most cases was very large. A detailed examination of the data explained the reason for this failure.

Quantitative predictive formulae assume that the events used for the prediction are free to vary without systematic

limitations. The formula could still be useful if the limitations on the events were constant from one time (semester) to the next. At most community colleges, this assumption is unwarranted when dealing with student enrollments. For popular courses, the census enrollment and WSCH are determined primarily by the number of sections offered, the class size limits imposed, and the time at which the sections are offered. If, for instance, six sections of Accounting I were offered for three semesters, and this were increased to eight for a fourth semester, there will be a 33% increase in enrollments and WSCH. This gross variation is enough to negate the usefulness of the prediction. The shape of the regression line is so distorted, regardless of which formula is used, that the standard error of estimate is intolerable--it results in horrendous error; in some instances, one comes closer to accurate prediction using random numbers!

Said another way, as long as community colleges artificially (systematically) limit or increase the number of students enrolled in specific programs and courses by changing the course and section offerings, quantitative models such as the CSUN model will not be valuable for enrollment projections.

Recommendations

Considering the failure indicated by the results of the test of the quantitative model, one is left with the question of how best to make enrollment projections. Relatively accurate estimates can be made for total college enrollments without great difficulty. Using "seat of the pants" trend lines and adding

or substracting enrollments with knowledge of local economic and demographic factors will permit the preceptive and sensitive registrar or admissions officer to come fairly close to some overall college enrollment and WSCH pattern. Though this total enrollment projection has some use, it doesn't permit the college administration to make decisions about the expansion, deletion or modification of individual programs and courses.

One must resort to general trends to make decisions about courses and programs. In some instances, this is a simple task. If one has a choice of hiring an instructor for a humanities area (e.g., literature or specialized history) or for a popular technical field (e.g., computer science, accounting), there is a high probability the technical field will win out. The community demand for specific kinds of instruction determines such decisions. However, some means must be found to provide the administration with information for improving the decisions made about program and course modification: changing the course offerings, changing the time of day courses are offered, or modifying the courses and programs. The Office of Institutional Research suggests the following:

1. Though the ultimate decision must be made by the administration, the department heads and key faculty members should be an integral part of the process.
2. Using the previous five years' Active Student Enrollment Reports for census and final weeks, each course should be examined for a trend.

This trend should always be qualified by the number and time of day the sections of courses are offered.

3. The decisions for expansion or reduction must be further qualified by the concept of "mission." For example, if we are to continue to be an institution of higher education, to care about our transfer function and academic scholarship, even sparsely attended humanities courses must be continued.

The above recommendations are not new; they represent the procedures that are presently implemented, but in a relatively haphazard fashion. The general recommendation of the Research Office is that each assistant dean, together with department heads, systematically make the projections for each of the programs and courses for which they are responsible. It is only through a set of systemic procedures with the active and enthusiastic participation of both administration and faculty that responsible projections can be made for courses and programs.

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